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# SOIL CONSERVATION SERVICE NEWS

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REGION 4

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## ENTHUSIASTIC CROWDS GREET DR. BENNETT

Dr. H. H. Bennett, Washington, D. C., Chief of the Soil Conservation Service, spoke to approximately 12,000 persons who attended three meetings in Region 4 early in June at each of which Dr. Bennett delivered the principal address.

Approximately 8,000 persons attended the third annual field day and picnic at Waldron, Arkansas, on June 9, which was sponsored by the Poteau Valley Soil Conservation Association. Dr. Bennett said those in attendance at Waldron represented the "greatest gathering of people in the interests of soil conservation I have ever seen."

Nearly 2,000 farmers, businessmen, agricultural workers and farm boys and girls attended the field day at Vernon, Texas, on June 13, which was sponsored by the Adams Creek Soil Conservation Association.

Opening the division dealing with conservation of soil and water Dr. Bennett, on June 14, spoke to nearly 2,000 students, farmers, businessmen, and agricultural workers interested in the course on conservation of natural resources offered by the North Texas State Teachers College at Denton, Texas.

Dr. Bennett commended the college for taking the lead in adding conservation to the course of study and indicated that a partial solution of the erosion problem can be effected by schools and colleges through the enlightenment of the younger generation--those who will do the farming a few years hence. General conservation courses

can awaken public interest to the need for erosion control and more specific courses can teach actual control methods, Dr. Bennett pointed out.

"The fact that our colleges and universities are beginning to offer courses in soil conservation is to me one of the most hopeful signs that American people are beginning to wake up to the seriousness of the problem ahead," he said.

From Waldron, Dr. Bennett, accompanied by Louis P. Merrill, regional conservator, J. W. Sargent, state coordinator for Arkansas, and Glenn Riddell, assistant state coordinator, visited the Mine Creek Soil Conservation District with headquarters at Nashville.

Dr. Bennett attended a meeting of the Board of Supervisors of the district where he commended Arkansas for the rapid progress made in the establishment of districts.

"The supervisors of these districts are doing a fine job," Dr. Bennett declared. "There is no cause to be alarmed about destruction of our farms by erosion when the farmers themselves band together for a fight to the finish against this evil as they have done in these Arkansas districts. They recognize the existence of an erosion problem and are conscientiously solving the problem by cooperative effort."

"The United States cannot expect to become a permanent nation unless it conserves its basic asset--the soil," Dr. Bennett said during his visit to Region 4. "Erosion is a cancer on the social and economic structure of the nation and unless it is plucked out we cannot expect to maintain a stabilized agriculture. Soil is the mother and life of the nation and we must depend on it for everything we need to maintain civilization.

"The American people, possessed of good sound judgment and common sense will not permit the destruction of productive farmland to continue unchecked. I have confidence enough in them to believe that they will use the tools of control that have been tested and proved to be effective and preserve this nation from destruction," he declared.

"It will take the whole-hearted cooperation of every man, woman, and child in the United States to bring about the establishment of complete erosion control programs on every farm in the nation."

Pointing to the districts program as one means of obtaining wide-spread establishment of control practices, Dr. Bennett said: "Our work has only begun. We cannot hope to completely check erosion until all the land susceptible to erosion is adequately protected. It is apparent however, that because of the enormous acreage and complex human factors involved, this protection cannot be brought about by any one agency or group of agencies without the active support of those who live on, and use the land.

"Interest in soil conservation districts is a deeply significant movement that is gaining momentum in most of our states. Boundaries of these soil conservation districts may be those of a large natural watershed covering two or three hundred thousand acres or more. Again, a district may include only the land in a relatively small area where erosion is prevalent. The underlying principle is to tackle the erosion problem on a geographic, natural basis-- not by townships, counties or even states. Erosion does not respect artificial boundaries. Nor does it respect the fence lines put up by one farmer to separate his land from that of another. In a watershed, control of erosion must start at the crest of the ridges and work down, acre by acre, field by field.

"To accomplish a task of this kind there must be an organization--a medium through which farmers can work together toward a common objective. But there must be more than that. Effective soil conservation requires a complete knowledge of all conditions in a watershed or natural land use area. There must be a clear picture of the entire land area--soil types, topography, erosion conditions, climate, current land use, economic conditions and other factors.

"In very few cases do farmers have the technical knowledge or means to gather all this information and round it into usable form. Consequently, when farmers organize for soil conservation they must be in a position to request and receive assistance of this kind from all federal and state agencies that are able to provide it. It is through the organization of legally constituted state soil conservation districts that this can be accomplished.

"I think our farmers should get together among themselves, talk over their problems and seek a solution through mutual assistance and friendly cooperation with each other. The district organization makes it possible for them to pool their resources for the good of all.

"These soil conservation districts will strike at the very roots of countless other agricultural problems. I feel sure that they will be of help in the ultimate solution of such broad problems as tax delinquency and rural poverty. They will preserve the soil for the use of this and future generations," he stated.

"In traveling about the country, I have have seen thousands of poverty stricken farmers struggling to eke out an existance from poverty stricken land. Each year these sub-soil farmers sink a little lower into the economic morass. Washed out, gullied and barren of fertility, the land offers them no hope whatever of bettering their lot in life, much less of paying taxes and educating their children. When the land declines so inevitably must the population dependent on it for existance decline also," Dr. Bonnett declared.

He pointed out that 25 states now have soil conservation district laws and that 60 districts have been organized, 10 of these being in the state of Arkansas.

## DISTRICT WORK MOVES FORWARD RAPIDLY IN ARKANSAS

Two hundred farmers who operate land located within the boundaries of the ten state soil conservation districts in Arkansas have entered into cooperative agreements with their respective boards of supervisors, for the establishment of conservation farming practices on their lands, J. W. Sargent, state coordinator for the Service in Arkansas has been informed.

It was announced by the 10 boards of supervisors that technicians of the Soil Conservation Service assigned to each district have completed conservation surveys on 222,993 acres of land in the 10 districts.

As of June 1, 1938, complete plans of conservation operations had been drawn up for nearly 300 farms.

There are 35,190 farms located within the boundaries of the 10 districts comprising a land area of approximately 4,000,000 acres. Arkansas is one of the 25 states that have enacted state legislation providing for the establishment of districts. Eleven of the states have organized 39 soil conservation districts covering a land area of more than 19,000,000 acres.

The Arkansas districts in operation are:

Greene County-Crowley Ridge: composed of 1,948 farms covering 184,300 acres located in Green County. Conservation work has been started on three interior watersheds comprising 35,000 acres set up as priority areas. Six hundred and twenty-one farms are located in priority areas.

Lower East Saline: composed of 2,000 farms covering an area of 489,000 acres located in parts of Lincoln, Drew and Ashley counties. Twelve interior watershed units composed of 200 farms have been set up as work priority areas.

Mine Creek: composed of 667 farms covering 88,500 acres in Howard County.

East Central Arkansas: composed of 10,000 farms covering 710,000 acres located in parts of Cleburne, White, Lonoke, Pulaski and Faulkner Counties. Work priority areas have been set up on six small interior watersheds in which 450 farms are located.

Magazine: composed of 350 farms covering 65,000 acres located in Logan County. The entire district is being treated as a unit, first farmers making application being given priority by the supervisors.

Poteau River: composed of 1,970 farms covering 142,000 acres located in Scott County.

Tri-River: composed of 1,250 farms covering approximately 390,000 acres located in Randolph and Lawrence Counties. Three interior watersheds and one problem area have been set up for work priority. Two hundred and thirty-seven farms are located in priority areas.

Illinois Bayou: composed of 2,700 farms covering 183,484 acres located in Pope County. Three small interior watersheds and one other area have been set up for work priority. One hundred and fifty-three farms are in the priority areas.

Crooked Creek: composed of 2,493 farms covering a land area of 385,000 acres located in parts of Boone, Marion, Searcy, and Newton Counties. Six interior watersheds on which 350 farms are located have been set up for work priority areas.

Central Valleys: composed of 7,500 farms covering a land area of 1,250,000 acres located in Van Buren, Pope, Conway, Faulkner, and Cleburne Counties. Four interior watersheds on which 325 farms are located have been set up for work priority.

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## NEW BOOKS ADDED TO REGIONAL LIBRARY

The following books are among those that have recently been added to the Regional Library:

Cox, J. F. and Jackson, L. E. - CROP MANAGEMENT AND SOIL CONSERVATION. John Wiley & Sons, N. Y. 1937.

Parkins, A. E. and Whitaker, J. R. - OUR NATURAL RESOURCES AND THEIR CONSERVATION. John Wiley & Sons, N. Y. 1936.

Stapledon, R. G. - THE LAND, NOW AND TO-MORROW. Faber and Faber, London. 1936.

The personnel of the Service in the field are invited and encouraged to secure these books on a one, two or three week's loan basis.

# THE EFFECT OF EROSION ON MOISTURE REQUIREMENTS OF PLANTS

By

Edgar A. Hodson,
Regional Agronomist.

Reduced crop yields can be expected as soil erosion progresses, and although the actual loss of plant food is the principal factor causing lower production, there are other reasons which must be considered.

As erosion progresses, the remaining soil will hold less and less water, and in this connection, quoting T. A. Kiesselbach, "Transpiration as a Factor in Crop Production," Nebraska Agricultural Experiment Station Research Bulletin 6, pp. 143-154, 1916:-

"Plants grown in an impoverished soil require much more water for the production of a given amount of air-dry vegetable matter than do plants grown in a good soil. Investigations, for example, show that Canadian field peas had a water requirement of 841 pounds for the production of 1 pound of dry vegetable matter when grown in an impoverished clay-loam soil. Wheat had a requirement of 472 pounds and 343 pounds of water per pound dry weight in the same types of poor and good soils, respectively.

"As impoverished soils contain less available water than similar good soils, and as notably more water is required in poor soils to produce a given unit of dry weight, it is easy to understand why depleted lands produce poor crops, why they are usually occupied by drought-resistant species, generally weeds, and why they are difficult to revegetate."

A major problem in handling eroded soils is to adopt practices that will develop a greater water-holding capacity. This can be done by increasing humus content through the use of manure, by turning under crops for green manure, or by establishing permanent vegetative cover. On any given soil type, the soil losses from erosion are reduced in proportion to the increase in humus content. The Soil Conservation Experiment Station at Clarinda, Iowa reports that corn planted on land with no treatment lost 25.8 tons of soil in one year. Under similar conditions, where 8 tons of manure was applied, the soil loss was 10.6 tons per acre. Where a crop of green manure was turned under the soil losses were 7.4 tons per acre.

The effectiveness of humus in increasing the water-holding capacity can best be understood when we realize the extent of the root-system of grasses and legumes.

"An interesting quantitative study of roots and root hairs of Kentucky bluegrass (also of rye) made by H. J. Dittmer, of Iowa State University demonstrated by calculations of measurements of counts that a plant of Kentucky bluegrass carefully removed with all roots intact from a lawn, had several thousand miles of roots and 6,600 miles of root hairs. Such information shows what remarkable soil-binding ability certain species of grass may have in their role to check soil erosion."

From the above estimates, it will be seen that an acre of blue-grass would contain the unbelievable amount of 200,000,000 or more miles of roots and root hairs.

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## WHEAT FOLLOWING HUBAM CLOVER SHOWS INCREASED YIELD

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Wheat planted on areas which had been devoted to Hubam Clover in strips on the State National Bank Farm west of Garland produced 18.1 bushels of grain to the acre, an increase of 10 bushels to the acre over the yield on areas where wheat followed corn, E. H. Varnell, project manager for the Duck Creek area near Garland has reported.

On another section of the same field wheat following Hubam Clover produced 11.8 bushels of grain to the acre compared with a 10.44 bushel yield of wheat from an area previously devoted to cotton and a 5.04 bushel per acre yield on areas previously planted to oats.

This test, designed to show the value of legumes for erosion control, soil improvement, and subsequent economical returns in the form of increased crop yields was started in the spring of 1937 when the farm was strip cropped with alternate bands of Hubam Clover, cotton, oats, and corn. The entire farm was planted to wheat in the fall of 1937, but markers indicating the former location of the strips were placed so that an accurate check of comparative yields on the various areas of the field could be obtained.

The comparison between the yields of wheat from the strip previously planted to Hubam Clover and an adjacent area planted

formerly to corn was obtained on a level section of the field. The soil type was Houston Black Clay. Comparisons of wheat yields from areas formerly planted to oats, cotton, and Hubam Clover were made on a section of the field with greater slope than the first and where the soil type was Houston Clay, shallow phase. The two different areas where Hubam, in strips, had been turned under for green manure were 144 feet apart.

The yield table follows:

First Set of Samples: soil type, Houston Clay:

| | |
|---|---|
| Wheat following Hubam Clover . . . . . | 18.1 bushels per acre |
| Wheat following corn . . . . . | 8.1 bushels per acre |

Second Set of Samples: soil type, Houston Clay, shallow phase:

| | |
|---|---|
| Wheat following Hubam Clover . . . . . | 11.8 bushels per acre |
| Wheat following cotton . . . . . | 10.44 bushels per acre |
| Wheat following oats . . . . . | 5.04 bushels per acre |

An excellent stand of volunteer clover has appeared on the wheat land which can be utilized as a seed crop, hay crop or soil building crop.

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## WOODLANDS CONSERVE SOIL AND WATER

By

Paul T. Gillett, Forester

Few farmers keep any record which shows the economic returns realized from their farm woodlands each year. Nine out of ten farmers have only a vague idea of the amount of wood they take from their woodlands.

Most of the them take their woodlands for granted. They go to the woods when the woodpile gets low, when the house needs new sills, when lumber is needed for a new shed, or when a few extra dollars are needed for taxes, trousers or wagons and the old woodlot has seldom disappointed them. Usually they have found what they wanted, and without much thought as to how much the material has meant to them in either convenience or dollars and cents value.

This attitude is very understandable. If the same farmer had an apple orchard with ever-bearing fruit so that at any time he could go out and pick enough for sauce and pies and jelly, he would soon lose track of how much his orchard produced, and probably lose his appreciation of the value of the crop. That is the way most cutting is done in farm woodlands.

We need woodlands in our program. Certain soils and slopes demand that protected woodland cover be left as the most effective, and often times the only satisfactory soil and water conservation measure. Our regional program has attempted to outline these conditions where woodland cover must be conserved or established.

But no measure or practice will become whole heartedly as well as officially adopted by the cooperating farmer unless he is provided with two things; i.e., an appreciation of the value of the measure or the practice in conserving the soil and water resources of his farm, and an appreciation of the value of the measure or the practice either in income or saving of expenditures. Money may not actually talk, but it is noted for the number of decisions that it makes.

We, who plan farm areas for soil and water conservation, must provide this appreciation along with our practices. In most cases this will be a harder job than the mere prescribing which we do. An insurance company spends far less time and money actually writing out and handling policies than it does in contacting individuals to provide them with an appreciation of the value of the protection which they offer.

We have to have facts which tend to provide this appreciation; facts which include a good knowledge of the farm, the farmer, and the farm woods area; and other facts with which to interpret these.

Here's a good beginning. If you were a farmer, what questions would you raise in regard to our woodland program? List all of these questions and then find out the answers. Some of these answers can be found from data supplied by research units. The greater number of answers will come, however, from the woodland, the farm, and the community itself.

Why should woodlands be protected from fire?

Why must grazing be controlled in woodland areas?

Why does protected woodland conserve more soil and water than other forms of cover?

Why do steep slopes with grass or woodland cover cause more soil loss when grazed than when livestock is excluded?

What growth return can be expected in specific woodlands?

What growth return prevails in these same woodlands?

Why the big difference in actual and potential growth?
What effect does this have on the farm, the wood supply, and the farmer's pocketbook?
What would happen if woodlands were used for other purposes?
How would such a conversion of land use affect the farm, the wood supply, and the farmer's pocketbook?

These and many other questions hold the secret of the value of our woodland program, and they must be answered for our cooperating farmers.

Do you know that actual experimental data, developed by the Central States Forest Experiment Station at Columbus, Ohio and the Sylamore Experiment Forest Station in Arkansas shows protected forest cover the most effective soil and water conserving mantle that has thus far been tested? That soil loss from a cultivated field on the Holly Springs, Mississippi Experiment Station has been accurately measured as 4300 times the soil loss from this protected woodland on same soils, slopes, length of slopes, etc.? That soil loss is four times as great from bermuda-grass pasture, well established? That an area of broom sedge grass which had been neither burned nor grazed for a number of years showed only about a third as much run-off as well established bermuda grass pasture, simply because this protection had allowed a great accumulation of trash and dead grass on the ground in the broom sedge patch which was very much the same as the accumulation of leaves, twigs, or debris in a protected woodland, but that the presence of the cows in the bermuda grass pasture had compacted the soil and prevented this accumulation and the water-holding capacity of the cover had been materially reduced as a result? Did you know that some other experiments show that run-off is about 60 times as great in a grazed woodland than in the same woodland where grazing has been restricted? That 94 times as much soil was removed in the grazed woodland? Did you know that experiments at Guthrie, Oklahoma, show that over 100 times as much run-off occurs in a burned woods area as occurs in a similar woods unburned? And that soil loss was 15 times as great? That the litter in the protected woodland is given credit for having absorbed almost 17 tons of rainfall per acre in one month, in addition to 73 tons of rainfall absorbed by the protected forest soil, which ran off the burned woodland? Did you know that farm woodlands in Region 4 are at least a 10 million dollar annual crop, the market for which, though far from ideal, has been decidedly more stable than for most farm crops? Did you know that due to various combinations of poor practices the present growth return is a mere fraction of the possibilities?

Let's appreciate woodlands; then, let's help our cooperators appreciate them.

# TERRACE MAINTENANCE

By

R. B. Moore,
Assistant Agricultural Engineer.

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The success of a well designed and constructed terrace system depends largely on whether it is adequately maintained and farmed after construction.

A large percentage of the terraces that have been in use for several years are no longer effective because improper maintenance and tillage practices have reduced the capacity of the terrace channel to such an extent that overtopping is frequent.

The initial cost of construction makes terracing one of the most expensive erosion control measures used, and with this in mind it is necessary that considerable effort be put forth to secure and maintain a desirable cross-section. The most desirable terrace cross-section and interval can be obtained by maintaining and developing the terrace channel by plowing it out and varying the location of other dead furrows and back furrows during successive plowings.

The method which has been tried in the field and which has given satisfactory results consists of making one land from the top of the terrace ridge to the terrace channel and an equal distance above the terrace channel. This plowing keeps the channel clean of silt and weeds and maintains the effective height of the ridge. During the second maintenance plowing of this land, the dead furrows should be moved 1 or 2 feet above the previous dead furrow, depending on the size and shape of the water channel. This plowing tends to give a broader channel with more water carrying capacity, and also eliminates the small ridge created above the terrace channel by the previous plowing. On further successive plowings the dead furrow should be moved back and forth between these lines. The remaining area should be broken alternately as one land and two lands, always backfurrowing to the ridge. The purpose of alternating this area between in one land and two lands is to avoid the formation of small permanent ridges and channels in the terrace interval.

## SARGENT NAMED ASSOCIATE REGIONAL CONSERVATOR

Appointment of J. W. Sargent, Little Rock, state coordinator for the Service in Arkansas, as associate regional conservator has been announced by Louis P. Merrill, regional conservator. Mr. Sargent will make his headquarters at the regional offices in Fort Worth and will enter upon his new duties on July 1.

Mr. Merrill also announced that Glenn Riddell, now assistant coordinator for Arkansas, will become state coordinator, effective July 1, and that W. O. Melton, project manager at Harrison, Arkansas, will succeed Mr. Riddell as assistant Arkansas coordinator.

Under Mr. Sargent's direction soil conservation progress has been rapid in the state of Arkansas. The first state to pass enabling legislation providing for the establishment of state soil conservation districts, Arkansas now has ten of these districts in operation. The area of these districts totals approximately 4,000,000 acres located on 35,190 farms. Mr. Sargent actively assisted other state agricultural leaders in formulating plans for the establishment of districts.

A veteran agricultural worker, Mr. Sargent became state coordinator for the Service in August 1935. Prior to this time he had been the county agricultural agent for Pulaski County, with headquarters in Little Rock, for more than 19 years.

He was born in Winston County Mississippi, December 18, 1885, and was graduated from Mississippi State College with the class of 1909. He served as superintendent of various Mississippi Agricultural High Schools before entering county agent work at Texarkana in June 1918.

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